

This listing of claims will replace all prior versions and listings of claims in the application.

**Listing of Claims:**

1(original). A method for producing a particulate carbon product ~~in a reactor vessel wherein gas flow between a gas inlet port and a gas outlet port suspends a bed of catalyst-containing particulate material in said vessel and said particulate carbon product is discharged from said vessel by falling from the bed~~ comprising:

- flowing a gas through an inlet port in a lower section of a reactor vessel having a first cross-sectional area;
- passing said gas from the lower section to an upper section of the reactor vessel having a second cross-sectional area, via a middle section having a cross-sectional area smaller than said first and second cross-sectional areas;
- flowing said gas through a gas outlet port in the upper section;
- using the flow of said gas to support a reaction bed of catalyst-containing particulate material in said upper section;
- harvesting a carbon product by allowing it to fall from said upper section into said lower section; and
- discharging particulate carbon product from the lower section of the reactor vessel via an outlet port.

2(original). A method as claimed in claim 1, wherein the particulate carbon product is prevented from passing through the gas outlet port by means of a gas permeable barrier.

3(currently amended). A method as claimed in claim 1, wherein the gas flow between the gas inlet port and gas outlet port is such that the reaction bed is a fluidised bed.

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4(currently amended). A method as claimed in claim 1, wherein the gas flow between the gas inlet port and gas outlet port is such that the reaction bed is a fixed bed.

5(previously presented). A method as claimed in claim 1 wherein catalyst is introduced into the reactor vessel via the gas inlet port.

6(original). A method as claimed in claim 5, wherein the inlet gas comprises a carbonaceous gas and the catalyst is entrained therein.

7(previously presented). A method as claimed in claim 1 wherein the catalyst is a transition metal.

8(currently amended). A method as claimed in claim 1 wherein catalyst is introduced into the reactor vessel beneath the reaction bed.

9(currently amended). A method as claimed in claim 1 wherein the catalyst is introduced into the reactor vessel proximate the reaction bed.

10(currently amended). A method as claimed in claim 1 wherein the temperature in the reaction bed is between 400 and 900 deg. C.

11(currently amended). A method as claimed in claim 1 wherein the temperature in the reaction bed is between 550 and 900 deg. C.

12(currently amended). A method as claimed in claim 1 wherein the pressure within the reaction bed is between 2 and 25 bar.

13(currently amended). A method as claimed in claim 1 wherein the pressure within the reaction bed is between 5 and 20 bar.

14(currently amended). A method as claimed in claim 1 wherein the pressure within the reaction bed is between 5 and 15 bar.

15(previously presented). A method as claimed in claim 1 wherein inlet gas is introduced into the reactor vessel at an elevated temperature.

16(previously presented). A method as claimed in claim 1 wherein inlet gas is introduced into the reactor vessel via a plurality of gas inlet ports.

17(original). A method as claimed in claim 16 wherein inlet gas is introduced into the reactor vessel at different temperatures.

18(currently amended). A method as claimed in claim 1 wherein carbon particulate product is discharged through a product outlet port disposed beneath the reaction bed.

Claims 19-43(canceled).

44(new). A reactor for producing a particulate carbon product comprising a vessel having:

- a lower section having a gas inlet port, said lower section defining a particulate product outlet port and having a first cross-sectional area;
- an upper section having a gas outlet port, said upper section defining a reaction bed and having a second cross-sectional area; and
- a middle section having a cross-sectional area smaller than said first and second cross-sectional areas, said middle section connecting said upper and said lower sections, wherein in use gas flow from said lower section through said middle section to said upper section suspends a bed of catalyst-containing particulate material in said upper section and particulate carbon product is discharged from the lower section of the vessel after falling from said bed.

45(new). A reactor as claimed in claim 44, further comprising a gas permeable barrier arranged between the gas outlet port and the bed such that in use particulate

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carbon product is prevented from passing through the gas outlet port.

46(new). A reactor as claimed in claim 45, wherein the gas permeable barrier defines the top of the reactor vessel.